NSF Earth Sciences Postdoctoral Fellowships (EAR-PF)

PROGRAM SOLICITATION
NSF 15-568

REPLACES DOCUMENT(S):
NSF 13-548

National Science Foundation

Directorate for Geosciences
    Division of Earth Sciences

Full Proposal Deadline(s) (due by 5 p.m. proposer's local time):

January 12, 2016

January 10, 2017

Second Tuesday in January, Annually Thereafter

IMPORTANT INFORMATION AND REVISION NOTES

- Deadline has changed to the second Tuesday in January;
- The requirement for a broadening participation activity has been changed to educational activities;
- Guidelines for the project summary page have been augmented to also require identification of the EAR program that aligns with research topic;
- Eligibility criteria has been modified:
    - applicants who choose to carry out the postdoctoral fellowship at the institution where they received their PhD or their current institution at the time of submission must: (1) have been at this institution for at least 12 months at the time of submission; (2) present a strong justification and clearly explain the benefits of this choice to their research and educational goals; and (3) have two scientific mentors, one at the hosting institution and a second mentor at a different institution who is a new collaborator with the applicant;
    - The research plan must be original and not have been a component of proposals previously submitted to the Division of Earth Sciences;
- Additional solicitation specific review criteria have been augmented to explicitly state how scientific leadership would be assessed.

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 15-1), which is effective for proposals submitted, or due, on or after December 26, 2014. The PAPPG is consistent with, and, implements the new Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) (2 CFR § 200).

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

    EAR Postdoctoral Fellowships (EAR-PF)

Synopsis of Program:

The Division of Earth Sciences (EAR) awards Postdoctoral Fellowships to recent recipients of doctoral degrees to carry out an integrated program of independent research and education. The research and education plans of each fellowship must address scientific questions within the scope of EAR disciplines. The program supports researchers for a period of up to two years with fellowships that can be taken to the institution of their choice (including facilities abroad). The program is intended to recognize beginning investigators of significant potential, and provide them with research experience, mentorship, and training that will establish them in leadership positions in the Earth Sciences community. Because the fellowships are offered only to postdoctoral scientists early in their career, doctoral advisors are encouraged to discuss the availability of EAR postdoctoral fellowships with their graduate students early in their doctoral programs. Fellowships are awards to individuals, not institutions, and are administered by the Fellows.

Cognizant Program Officer(s):

Please note that the following information is current at the time of publishing. See program website for any updates to the points of contact.

- Lina Patino, telephone: (703) 292-5047, email: lpatino@nsf.gov

Applicable Catalog of Federal Domestic Assistance (CFDA) Number(s):

- 47.050 --- Geosciences

Award Information

Anticipated Type of Award: Fellowship

Estimated Number of Awards: 10

Ten fellowships per year contingent upon availability of funds.

Anticipated Funding Amount: $1,740,000

The expected annual budget for the EAR-PF program is $1.74 M, which accounts for 10 awards per year (87,000 per year per fellowship).

Eligibility Information

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Unaffiliated Individuals: Scientists, engineers or educators in the U.S. who are U.S. citizens.

Who May Serve as PI:

An individual is eligible to submit a proposal to the NSF EAR Postdoctoral Fellowship program if all the following criteria are met:

- Be U.S. citizens (or nationals) or legally admitted permanent residents of the United States (i.e., have a "green card") at the time of application;
- Either currently be a graduate student or, at the deadline date, have served in a position requiring the doctoral degree for no more than 18 full-time-equivalent months since earning the degree. If more than 18 months have elapsed between conferral of the doctoral degree and the deadline date, the candidate must include specific language in their Biographical Sketch (discussed below) affirming that they meet this eligibility requirement;
- Must present research plan that falls within the purview of the Division of Earth Sciences at NSF (http://www.nsf.gov/div/index.jsp?div=EAR);
- Applicants are encouraged to expand the network of collaborators and implement the fellowship at an institution new to the applicant. However, applicants who choose to carry out the postdoctoral fellowship at the institution where they received their PhD or their current institution at the time of submission must: (1) have been at this institution for at least 12 months at the time of submission; (2) present a strong justification and clearly explain the benefits of this choice to their research and educational goals; and (3) have two scientific mentors, one at the hosting institution and a second mentor at a different institution who is a new collaborator with the applicant;
- The research plan must be original and not have been a component of proposals previously submitted to the Division of Earth Sciences;
- Not have submitted concurrently the same project to another NSF program.

Limit on Number of Proposals per Organization:

Only individuals may submit proposals. There is no limit on the number of fellows that an institution may host.

Limit on Number of Proposals per PI or Co-PI: 1

Individuals may submit only one fellowship proposal to EAR per fiscal year.

Proposal Preparation and Submission Instructions

A. Proposal Preparation Instructions

- **Letters of Intent:** Not required
- **Preliminary Proposal Submission:** Not required
- **Full Proposals:**
  - Full Proposals submitted via FastLane: NSF Proposal and Award Policies and Procedures Guide, Part I: Grant Proposal Guide (GPG) Guidelines apply. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
  - Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov Guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide)

B. Budgetary Information

- **Cost Sharing Requirements:** Inclusion of voluntary committed cost sharing is prohibited.
- **Indirect Cost (F&A) Limitations:** Not Applicable
- **Other Budgetary Limitations** & Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

    January 12, 2016

    January 10, 2017

    Second Tuesday in January, Annually Thereafter

Proposal Review Information Criteria

Merit Review Criteria: National Science Board approved criteria. Additional merit review considerations apply. Please see the full text of this solicitation for further information.

Award Administration Information

Award Conditions: Additional award conditions apply. Please see the full text of this solicitation for further information.

Reporting Requirements: Additional reporting requirements apply. Please see the full text of this solicitation for further information.

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I. INTRODUCTION

The Division of Earth Sciences (EAR) offers two-year postdoctoral fellowships to provide opportunities for scientists early in their careers to obtain training beyond their graduate education. The postdoctoral fellowship program is intended to recognize beginning investigators of significant potential, and provide them with experience that will establish them in positions of leadership in the scientific community. During the tenure of the fellowships, participants will be conducting research on topics supported by EAR and implementing an education plan. Projects may employ any combination of field, laboratory, and computational studies with observational, theoretical, or experimental approaches. Fellows must affiliate with appropriate research institutions and are expected to devote themselves full time to the fellowship activities during its term.

II. PROGRAM DESCRIPTION

A. Appropriateness for EAR priorities

A research plan whose focus falls within the scope of any EAR discipline is eligible for support. EAR focuses on improving our understanding of the Earth's structure, composition, evolution, and the interaction with the Earth's biosphere, atmosphere, and hydrosphere. The list of EAR programs can be found at http://www.nsf.gov/div/index.jsp?div=EAR and include EarthScope,

Geobiology and Low Temperature Geochemistry, Geomorphology and Land Use Dynamics, Geophysics, Hydrologic Sciences, Petrology and Geochemistry, Sedimentary Geology and Paleobiology, and Tectonics. If you are uncertain of whether your research topic is within the purview of EAR disciplines, you are strongly encouraged to contact the cognizant program officer for this solicitation to discuss the appropriateness of the research. Proposals that address research topics outside the purview of EAR programs will be returned without review.

In addition, fellowship applicants are expected to include a coherent program of educational activities as part of their proposal. Examples of such activities include, but are not limited to, co-teaching one course at their host institution or at an academic institution with ties to their host institution, developing educational materials for formal or informal education venues, or engaging in a significant program of outreach or public education. As a rough guideline, fellows should plan on their educational activities taking no less than 10% and no more than 25% of their time. Applicants are encouraged to discuss the proposed educational activities with their proposed host institution prior to proposal submission to ensure that their educational plan is consistent with opportunities and plans at the institution.

B. Location of Work

Research and educational activities supported by this fellowship program may be conducted at any appropriate U.S. or foreign host institution. Appropriate institutions include colleges and universities, private nonprofit institutes and museums, government installations and laboratories. Fellows are expected to be fully integrated into the research and relevant activities of their host institution. The justification of the choice of institutions must be made clearly and compellingly in the proposal.

Because the objectives of the fellowships include broadening the perspectives and experiences of the Fellows and promoting interdisciplinary research careers, careful consideration should be given to the selection of the scientific mentor(s) and host institution(s). In general, NSF expects that the fellowship will support work at an institution(s) other that the fellow's graduate institution or organization of current affiliation. Consequently, candidates proposing to be hosted by their graduate/current institution must: (1) have been at this institution for at least 12 months at the time of submission; (2) present a strong justification and clearly explain the benefits of this choice to their research and educational goals; and (3) have two scientific mentors, one at the hosting institution and a second mentor at a different institution who is a new collaborator with the applicant.

EAR in cooperation with NSF's Office of International Science and Engineering support EAR Postdoctoral Fellows who wish to pursue significant international research collaborations. When such collaborations involve the fellow being at the foreign location(s) for a combined total of 9 months or longer, extra travel and research expenses may be allowed. See OISE guidelines for details (http://www.nsf.gov/od/oise/iprffapp.jsp).

C. The Scientific Mentor(s)

The Fellow must affiliate with a host institution(s) at all times during the entire tenure of the fellowship. The applicant is responsible for making prior arrangements with the host institution(s) and scientific mentor(s). If the location of work is the PhD granting institution or current institution at time of submission, the fellow must list **two scientific mentors**: a host mentor and an external mentor. The host mentor, at the location of work, will provide mentoring and guidance with research and educational activities, and will design a training program for the fellow. The external mentor and new collaborator, at a different institution, is expected to also provide guidance with the research activities and to facilitate the amplification of scientific perspectives of the fellow beyond those provided by the host mentor. An important basis for judging the suitability of the host institution(s) is the degree to which the institution letter(s) describes and offers a research, education, and mentoring plan that could not be provided without fellowship support. (See Section V.A. Proposal Preparation Instructions for additional information about the institution letter.)

III. AWARD INFORMATION

A. Duration and Tenure

Up to 24 full-time-equivalent months of support may be requested. Fellowship tenures must begin within 12 months of proposal submission deadline, and start on the first of the month.

Interruptions in tenure or extensions without additional cost to NSF are permitted only for circumstances beyond the control of the fellow and require NSF approval.

Within the fellowship period, one month per year of fellowship duration may be used for paid leave, including parental or family leave. The paid leave cannot be used to increase the level of NSF support beyond the duration of the fellowship. NSF enables career-life balance through a variety of mechanisms. For more information, please see http://www.nsf.gov/career-life-balance/.

Successful applicants will be notified on or about June 1st following the proposal submission deadline. Those applicants selected to receive fellowships will be contacted by NSF and asked to provide additional information, such as completing acceptance forms and starting certificates, before starting their fellowships. Successful applicants who have not completed their PhD at the time of application must provide certification of receipt of the PhD before receiving their fellowship award. Normally fellowships will be held at institutions specified in the proposal, but under certain circumstances, and with suitable justification, Fellows may transfer during the tenure of the fellowship to a new institution upon approval by NSF.

Fellowships are not renewable

During the tenure of the fellowship, no additional appointment or fellowship may be held without permission of the cognizant NSF program officer.

B. Stipend and Allowances

The total fellowship amount is $87,000 per year consisting of two components:

- A stipend is $62,000 per year paid directly to the Fellow on a monthly schedule;
- An annual fellowship allowance of $25,000 paid directly to the Fellow and intended to cover costs of the fellowship

including:

- expenses directly related to the conduct of the proposed research and educational activities, including but not limited to materials and supplies, equipment, computing resources, access to databases, travel, publication charges, and subscription fees;
- expenses in support of the Fellow, such as office space, general purpose supplies and use of equipment, facilities and other institutional resources; and
- expenses in support of fringe benefits, including but not limited to individual or family health insurance provided through a group or individual plan, dental and/or vision insurance, disability insurance, retirement savings, dependent care, and moving expenses.

An additional allowance may be available for applicants spending 9 months or longer at a foreign location(s) through joint funding with NSF's Office of International Science and Engineering.

No additional appointment or fellowship may be held during the period of the fellowship. No other remuneration from any source may be accepted during the period of the fellowship without permission of the program officer.

IV. ELIGIBILITY INFORMATION

Who May Submit Proposals:

Proposals may only be submitted by the following:

- Unaffiliated Individuals: Scientists, engineers or educators in the U.S. who are U.S. citizens.

Who May Serve as PI:

An individual is eligible to submit a proposal to the NSF EAR Postdoctoral Fellowship program if all the following criteria are met:

- Be U.S. citizens (or nationals) or legally admitted permanent residents of the United States (i.e., have a "green card") at the time of application;
- Either currently be a graduate student or, at the deadline date, have served in a position requiring the doctoral degree for no more than 18 full-time-equivalent months since earning the degree. If more than 18 months have elapsed between conferral of the doctoral degree and the deadline date, the candidate must include specific language in their Biographical Sketch (discussed below) affirming that they meet this eligibility requirement;
- Must present research plan that falls within the purview of the Division of Earth Sciences at NSF (http://www.nsf.gov/div/index.jsp?div=EAR);
- Applicants are encouraged to expand the network of collaborators and implement the fellowship at an institution new to the applicant. However, applicants who choose to carry out the postdoctoral fellowship at the institution where they received their PhD or their current institution at the time of submission must: (1) have been at this institution for at least 12 months at the time of submission; (2) present a strong justification and clearly explain the benefits of this choice to their research and educational goals; and (3) have two scientific mentors, one at the hosting institution and a second mentor at a different institution who is a new collaborator with the applicant;
- The research plan must be original and not have been a component of proposals previously submitted to the Division of Earth Sciences;
- Not have submitted concurrently the same project to another NSF program.

Limit on Number of Proposals per Organization:

Only individuals may submit proposals. There is no limit on the number of fellows that an institution may host.

Limit on Number of Proposals per PI or Co-PI: 1

Individuals may submit only one fellowship proposal to EAR per fiscal year.

V. PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

A. Proposal Preparation Instructions

Full Proposal Preparation Instructions: Proposers may opt to submit proposals in response to this Program Solicitation via Grants.gov or via the NSF FastLane system.

- Full proposals submitted via FastLane: Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the NSF Grant Proposal Guide (GPG) and the additional solicitation specific instructions provided below. The complete text of the GPG is available electronically on the NSF website at: http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg.
- Full proposals submitted via Grants.gov: Proposals submitted in response to this program solicitation via Grants.gov should be prepared and submitted in accordance with the NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov and the additional solicitation specific instructions provided below. The complete text of the NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: (http://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

See Chapter II.C.2 of the GPG for guidance on the required sections of a full research proposal submitted to NSF. Please note that the proposal preparation instructions provided in this program solicitation may deviate from the GPG instructions.

Please note that the proposal preparation instructions provided in this program solicitation deviate from and/or supplement the GPG instructions.

Application Preparation Instructions for Fellowships

A full proposal consists of many parts and requires input from the fellowship applicant and the proposed scientific mentor(s). Applicants are advised to begin the proposal well in advance of the submission deadline and to submit as early as possible. Partially completed proposals may be saved for future completion and submission. The submission of incomplete or late proposals is not permitted.

Before starting proposal preparation, the applicant must be registered as an individual. To register as a new individual in FastLane go to: https://www.fastlane.nsf.gov/cgi-bin/N1CheckRO. B. To register as a new individual in Grants.gov go to: http://www.grants.gov/applicants/individual_registration.jsp. **Fellowship proposals must be submitted by the Fellowship applicant, not by the applicant's current or proposed organizational Sponsored Projects Office (SPO).** The applicant serves as his/her own SPO and Authorized Organizational Representative (AOR) for the purposes of any research administration functions in FastLane or Grants.gov.

Proposals must include all of the following items. *In cases where requirements given in this document differ from those given in the NSF Grant Proposal Guide (GPG) or the NSF Grants.gov Application Guide, this solicitation takes precedence.*

- NSF Cover Page: FastLane Users: Select the EAR-PF program solicitation number shown at the beginning of this solicitation from the drop-down menu. Grants.gov Users: The program solicitation number will be pre-populated by Grants.gov on the NSF Grant Application Cover Page. The title must start with the acronym "EAR-PF", followed by the descriptive title of the research. If the project will involve international partners, check the "International Cooperative Activities" box and identify the country/countries involved.
- Information about Principal Investigators/Project Directors.
- Table of Contents. This form will be automatically generated by FastLane or Grants.gov.
- Project Summary: not more than one page in length that includes an overview of the project and separate statements that clearly address the intellectual merit and broader impacts. In addition, the Project Summary must also identify (in the overview section):
    - Proposed scientific mentor(s)
    - Proposed host organization(s)
    - EAR program that aligns with research topic
- Project Description, not to exceed ten (10) single-spaced pages (including figures, pictures, and tables), which must include the following information: (1) detailed plans for research and educational activities; and (2) a detailed justification for the choice of the host institution(s) and scientific mentor(s), identifying collaborating scientist(s), and relating the proposed work to current research and educational efforts at the host institution(s).
- References Cited. See the Grant Proposal Guide for format.
- Biographical Sketch of the applicant, not to exceed two (2) pages. See the Grant Proposal Guide for format. The Biographical Sketch must include identification of U.S. citizenship or permanent resident status, and the month and year when PhD was (or is expected to be) received. If more than 18 months have elapsed between the date that the doctoral degree was conferred and the EAR-PF proposal deadline, the Biographical sketch must include the following statement: "I affirm that I have not worked for more than 18 full-time-equivalent months in positions for which the doctoral degree was a requirement." Other components of biographical sketches described in the Grant Proposal Guide must be included as well. **Only the applicant's Biographical Sketch should be uploaded in this section.** Biographical Sketches for PhD advisor and scientific mentor(s) must be included in the Single Copy Document section.
- NSF Budget Page. The stipend and activities allowance should be entered in, Participant Support Costs (Section F on the FastLane budget and Field E on the Grants.gov budget). Enter the $62,000 stipend in F.1 (FastLane) or E.2 (Grants.gov) and the $25,000 activities allowance in F.4 (FastLane) or E.5 (Grants.gov). Enter (1) as the total number of participants. An annual budget page must be submitted for each of up to two years of the fellowship support. A budget justification of no more than two pages should document and justify the estimated costs as organized in the budget components described above.

FastLane users: Since no person months and no salary are being requested for senior personnel, the PI (fellow) should be removed from section A of the budget. This can be done by clicking "Add\Delete Senior Personnel", then "Check to remove" by the name, on the budget form. Additional information is available on the FastLane website at: https://www.fastlane.nsf.gov/fastlane.jsp;jsessionid=957fa123f59d4065f3de347559b2:Dqk3?t=0&idx=5.

- Current and Pending Support. Include current support for research and training. Under pending support, include this proposal, as well as pending and planned applications to other fellowship or research programs.
- Facilities, Equipment and Other Resources, as applicable. Insert text or upload a document that states "See Letter(s) of Commitment from the prospective host organization(s)."
- Supplementary Documentation:
    - Data Management Plan, not to exceed two (2) pages, to be submitted as Supplementary Documentation. All proposals must include a supplementary document labeled "Data Management Plan" that describes plans for data management and sharing of the products of research, or asserts the absence of the need for such plans. See the Grant Proposal Guide.
    - The letter of commitment from the proposed scientific mentor(s) (one letter per institution), as described below, should be submitted as supplementary document:
        - The letter(s) of commitment from the prospective scientific mentor(s) should be signed by both the department chair (or equivalent) and the proposed scientific mentor(s);
        - The letter(s) should certify that the applicant's proposal has been read and approved by the proposed scientific mentor(s);
        - That adequate facilities and support will be provided for the fellow;
        - The letter should include a mentoring plan that discusses the role the proposed scientific mentor(s) will play in the professional development of the fellow, and of the opportunities for training and research at the host institution that will be of particular benefit to the fellow;
        - Should the applicant propose to hold the fellowship at more than one institution through the 2-year tenure, letters of commitment must be provided for all institutions involved;
        - Since this program relies on reviewed proposals rather than applications, letters of recommendation will not be considered. Thus the letter of commitment from the institution should not constitute a letter of recommendation.
- Single Copy Documents:
    - Biographical sketch of PhD advisor and proposed scientific mentor(s). Their biographical sketches should follow the same format as described earlier;

- List of suggested reviewers (optional);
- Some proposals may require other documentation before the final decision can be made, e.g., government permits and letters of collaboration. Their existence should be noted in the project description but they should not be included in the application. NSF may request them later.

B. Budgetary Information

Cost Sharing: Inclusion of voluntary committed cost sharing is prohibited

Other Budgetary Limitations:

Other budgetary limitations apply. Please see the full text of this solicitation for further information.

C. Due Dates

- **Full Proposal Deadline(s)** (due by 5 p.m. proposer's local time):

    January 12, 2016

    January 10, 2017

    Second Tuesday in January, Annually Thereafter

D. FastLane/Grants.gov Requirements

For Proposals Submitted Via FastLane:

Before starting proposal preparation, the applicant must be registered as an individual. To register as a new individual in FastLane go to: https://www.fastlane.nsf.gov/cgi-bin/N1CheckROB. Detailed technical instructions regarding the technical aspects of preparation and submission via FastLane are available at: https://www.fastlane.nsf.gov/a1/newstan.htm. For FastLane user support, call the FastLane Help Desk at 1-800-673-6188 or e-mail fastlane@nsf.gov. The FastLane Help Desk answers general technical questions related to the use of the FastLane system. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this funding opportunity.

Submitting the Proposal: Fellowship proposals must be submitted by the Fellowship applicant, not by the applicant's current or proposed organizational Sponsored Projects Office (SPO). The applicant serves as his/her own SPO and Authorized Organizational Representative (AOR) for the purposes of any research administration functions in FastLane. As such, the applicant, serving as the SPO/AOR must electronically sign and submit the proposal using the Sign and Submit button in FastLane. The applicant is signing on his/her own behalf and by signing the application NSF is in no way inferring that the applicant has assumed organizational status. Further instructions regarding this process are available on the FastLane Website at: https://www.fastlane.nsf.gov/fastlane.jsp.

For Proposals Submitted Via Grants.gov:

Before starting proposal preparation, the applicant must be registered as an individual. To register as a new individual in Grants.gov go to: http://www.grants.gov/applicants/individual_registration.jsp. Once registered, the applicant can then apply for grant opportunities which indicate "Individual" eligibility on the Grants.gov website. Comprehensive information about using Grants.gov is available on the Grants.gov Applicant Resources webpage: http://www07.grants.gov/applicants/app_help_reso.jsp. In addition, the NSF Grants.gov Application Guide provides additional technical guidance regarding preparation of proposals via Grants.gov. For Grants.gov user support, contact the Grants.gov Contact Center at 1-800-518-4726 or by email: support@grants.gov. The Grants.gov Contact Center answers general technical questions related to the use of Grants.gov. Specific questions related to this program solicitation should be referred to the NSF program staff contact(s) listed in Section VIII of this solicitation.

Submitting the Proposal: Fellowship proposals must be submitted by the Fellowship applicant, not by the applicant's current or proposed organizational Sponsored Projects Office (SPO). Once all documents have been completed, the applicant must submit the application to Grants.gov and verify the desired funding opportunity and agency to which the application is submitted. The applicant must then sign and submit the application to Grants.gov. The completed application will be transferred to the NSF FastLane system for further processing.

VI. NSF PROPOSAL PROCESSING AND REVIEW PROCEDURES

Proposals received by NSF are assigned to the appropriate NSF program for acknowledgement and, if they meet NSF requirements, for review. All proposals are carefully reviewed by a scientist, engineer, or educator serving as an NSF Program Officer, and usually by three to ten other persons outside NSF either as *ad hoc* reviewers, panelists, or both, who are experts in the particular fields represented by the proposal. These reviewers are selected by Program Officers charged with oversight of the review process. Proposers are invited to suggest names of persons they believe are especially well qualified to review the proposal and/or persons they would prefer not review the proposal. These suggestions may serve as one source in the reviewer selection process at the Program Officer's discretion. Submission of such names, however, is optional. Care is taken to ensure that reviewers have no conflicts of interest with the proposal. In addition, Program Officers may obtain comments from site visits before recommending final action on proposals. Senior NSF staff further review recommendations for awards. A flowchart that depicts the entire NSF proposal and award process (and associated timeline) is included in the GPG as Exhibit III-1.

A comprehensive description of the Foundation's merit review process is available on the NSF website at: http://nsf.gov/bfa/dias/policy/merit_review/.

Proposers should also be aware of core strategies that are essential to the fulfillment of NSF's mission, as articulated in *Investing in Science, Engineering, and Education for the Nation's Future: NSF Strategic Plan for 2014-2018*. These strategies are integrated in the program planning and implementation process, of which proposal review is one part. NSF's mission is particularly well-implemented through the integration of research and education and broadening participation in NSF programs, projects, and activities.

One of the strategic objectives in support of NSF's mission is to foster integration of research and education through the programs, projects, and activities it supports at academic and research institutions. These institutions must recruit, train, and prepare a diverse STEM workforce to advance the frontiers of science and participate in the U.S. technology-based economy. NSF's contribution to the national innovation ecosystem is to provide cutting-edge research under the guidance of the Nation's most creative scientists and engineers. NSF also supports development of a strong science, technology, engineering, and mathematics (STEM) workforce by investing in building the knowledge that informs improvements in STEM teaching and learning.

NSF's mission calls for the broadening of opportunities and expanding participation of groups, institutions, and geographic regions that are underrepresented in STEM disciplines, which is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

A. Merit Review Principles and Criteria

The National Science Foundation strives to invest in a robust and diverse portfolio of projects that creates new knowledge and enables breakthroughs in understanding across all areas of science and engineering research and education. To identify which projects to support, NSF relies on a merit review process that incorporates consideration of both the technical aspects of a proposed project and its potential to contribute more broadly to advancing NSF's mission "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes." NSF makes every effort to conduct a fair, competitive, transparent merit review process for the selection of projects.

1. Merit Review Principles

These principles are to be given due diligence by PIs and organizations when preparing proposals and managing projects, by reviewers when reading and evaluating proposals, and by NSF program staff when determining whether or not to recommend proposals for funding and while overseeing awards. Given that NSF is the primary federal agency charged with nurturing and supporting excellence in basic research and education, the following three principles apply:

- All NSF projects should be of the highest quality and have the potential to advance, if not transform, the frontiers of knowledge.
- NSF projects, in the aggregate, should contribute more broadly to achieving societal goals. These "Broader Impacts" may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. The project activities may be based on previously established and/or innovative methods and approaches, but in either case must be well justified.
- Meaningful assessment and evaluation of NSF funded projects should be based on appropriate metrics, keeping in mind the likely correlation between the effect of broader impacts and the resources provided to implement projects. If the size of the activity is limited, evaluation of that activity in isolation is not likely to be meaningful. Thus, assessing the effectiveness of these activities may best be done at a higher, more aggregated, level than the individual project.

With respect to the third principle, even if assessment of Broader Impacts outcomes for particular projects is done at an aggregated level, PIs are expected to be accountable for carrying out the activities described in the funded project. Thus, individual projects should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

These three merit review principles provide the basis for the merit review criteria, as well as a context within which the users of the criteria can better understand their intent.

2. Merit Review Criteria

All NSF proposals are evaluated through use of the two National Science Board approved merit review criteria. In some instances, however, NSF will employ additional criteria as required to highlight the specific objectives of certain programs and activities.

The two merit review criteria are listed below. **Both** criteria are to be given **full consideration** during the review and decision-making processes; each criterion is necessary but neither, by itself, is sufficient. Therefore, proposers must fully address both criteria. (GPG Chapter II.C.2.d.i. contains additional information for use by proposers in development of the Project Description section of the proposal.) Reviewers are strongly encouraged to review the criteria, including GPG Chapter II.C.2.d.i., prior to the review of a proposal.

When evaluating NSF proposals, reviewers will be asked to consider what the proposers want to do, why they want to do it, how they plan to do it, how they will know if they succeed, and what benefits could accrue if the project is successful. These issues apply both to the technical aspects of the proposal and the way in which the project may make broader contributions. To that end, reviewers will be asked to evaluate all proposals against two criteria:

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge; and
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to
   a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
   b. Benefit society or advance desired societal outcomes (Broader Impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the

proposed activities?

Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of societally relevant outcomes. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

Proposers are reminded that reviewers will also be asked to review the Data Management Plan and the Postdoctoral Researcher Mentoring Plan, as appropriate.

Additional Solicitation Specific Review Criteria

In addition to the above criteria, the following factors will be used in the evaluation process:

- Qualifications of the applicant and his/her potential for continued professional growth and leadership in the field. Leadership in the field would be assessed based on: (1) how the proposed project expands the scientific expertise of the applicant; (2) placement of the proposed project within the context of what is known on the subject; and (3) science communication track record;
- Qualifications and suitability of the proposed host institution and the scientific and educational collaborations proposed
- Prospective benefits to the applicant, the scientific discipline, and the activities of the host institution;
- If a second scientific mentor is included, the proposed plan for interactions among the applicant, host mentor and second scientific mentor will be evaluated based on its clarity and designed to promote the professional development of the fellow.

B. Review and Selection Process

Proposals submitted in response to this program solicitation will be reviewed by Ad hoc Review and/or Panel Review.

Reviewers will be asked to evaluate proposals using two National Science Board approved merit review criteria and, if applicable, additional program specific criteria. A summary rating and accompanying narrative will be completed and submitted by each reviewer. The Program Officer assigned to manage the proposal's review will consider the advice of reviewers and will formulate a recommendation.

After scientific, technical and programmatic review and consideration of appropriate factors, the NSF Program Officer recommends to the cognizant Division Director whether the proposal should be declined or recommended for award. NSF strives to be able to tell applicants whether their proposals have been declined or recommended for funding within six months. Large or particularly complex proposals or proposals from new awardees may require additional review and processing time. The time interval begins on the deadline or target date, or receipt date, whichever is later. The interval ends when the Division Director acts upon the Program Officer's recommendation.

After programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial, and policy implications. After an administrative review has occurred, Grants and Agreements Officers perform the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with a NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at their own risk.

Once an award or declination decision has been made, Principal Investigators are provided feedback about their proposals. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers or any reviewer-identifying information, are sent to the Principal Investigator/Project Director by the Program Officer. In addition, the proposer will receive an explanation of the decision to award or decline funding.

VII. AWARD ADMINISTRATION INFORMATION

A. Notification of the Award

Notification of the award is made to *the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Program administering the program. Verbatim copies of reviews, not including the identity of the reviewer, will be provided automatically to the Principal Investigator. (See Section VI.B. for additional information on the review process.)

B. Award Conditions

An NSF award consists of: (1) the award notice, which includes any special provisions applicable to the award and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award notice; (4) the applicable award conditions, such as Grant General Conditions (GC-1)*; or Research Terms and Conditions* and (5) any announcement or other NSF issuance that may be incorporated by reference in the award notice. Cooperative agreements also are administered in accordance with NSF Cooperative Agreement Financial and Administrative Terms and Conditions (CA-FATC) and the applicable Programmatic Terms and Conditions. NSF awards are electronically signed by an NSF Grants and Agreements Officer and transmitted electronically to the organization via e-mail.

*These documents may be accessed electronically on NSF's Website at http://www.nsf.gov/awards/managing/award_conditions.jsp?org=NSF. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone (703) 292-7827 or by e-mail from nsfpubs@nsf.gov.

More comprehensive information on NSF Award Conditions and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

Special Award Conditions:

The fellowship award is made to the individual, not the institution. Payments are made to the individual. Awards cannot be extended without prior NSF approval.

Candidates selected to receive fellowships will be contacted by NSF and asked to provide additional information, such as acceptance forms and starting certificates, before starting their fellowships. Successful candidates who have not completed their doctoral degrees at the time of application must provide certifications of the receipt of the PhD before receiving a fellowship award.

Normally fellowships will be held at the host institution(s) specified in the proposal; however, under certain circumstances and with suitable justification, fellowships may be transferred to a new organization upon approval by NSF.

No additional appointment or fellowship may be held during the period of the fellowship. No other remuneration from any source may be accepted during the period of the fellowship without permission of the program officer.

Candidates are encouraged to discuss institutional policies on intellectual property rights with the scientific mentor(s) before submitting the proposal. Candidates should also discuss the policies of the scientific mentor(s) regarding which materials will remain with the host organization(s) and which can be released to the Fellow at the conclusion of the fellowship.

Fellows are required to adhere to the EAR Data Policy available on the EAR website. Final reports for all awards should include a statement describing how the data policy requirements have been met.

C. Reporting Requirements

For all multi-year grants (including both standard and continuing grants), the Principal Investigator must submit an annual project report to the cognizant Program Officer at least 90 days prior to the end of the current budget period. (Some programs or awards require submission of more frequent project reports). Within 90 days following expiration of a grant, the PI also is required to submit a final project report, and a project outcomes report for the general public.

Failure to provide the required annual or final project reports, or the project outcomes report, will delay NSF review and processing of any future funding increments as well as any pending proposals for all identified PIs and co-PIs on a given award. PIs should examine the formats of the required reports in advance to assure availability of required data.

PIs are required to use NSF's electronic project-reporting system, available through Research.gov, for preparation and submission of annual and final project reports. Such reports provide information on accomplishments, project participants (individual and organizational), publications, and other specific products and impacts of the project. Submission of the report via Research.gov constitutes certification by the PI that the contents of the report are accurate and complete. The project outcomes report also must be prepared and submitted using Research.gov. This report serves as a brief summary, prepared specifically for the public, of the nature and outcomes of the project. This report will be posted on the NSF website exactly as it is submitted by the PI.

More comprehensive information on NSF Reporting Requirements and other important information on the administration of NSF awards is contained in the NSF *Award & Administration Guide* (AAG) Chapter II, available electronically on the NSF Website at http://www.nsf.gov/publications/pub_summ.jsp?ods_key=aag.

In addition to annual and final reports, Fellows must file:

1. an interim report 90 days after the start of the fellowship. This report must include a letter signed by the postdoc fellow and the host mentor on the expectations for the fellowship and the deliverables that must be produced at the end of the fellowship;
2. a termination certificate at end of the fellowship.

VIII. AGENCY CONTACTS

Please note that the program contact information is current at the time of publishing. See program website for any updates to the points of contact.

General inquiries regarding this program should be made to:

- Lina Patino, telephone: (703) 292-5047, email: lpatino@nsf.gov

For questions related to the use of FastLane, contact:

- FastLane Help Desk, telephone: 1-800-673-6188; e-mail: fastlane@nsf.gov.

For questions relating to Grants.gov contact:

- Grants.gov Contact Center: If the Authorized Organizational Representatives (AOR) has not received a confirmation message from Grants.gov within 48 hours of submission of application, please contact via telephone: 1-800-518-4726; e-mail: support@grants.gov.

IX. OTHER INFORMATION

The NSF website provides the most comprehensive source of information on NSF Directorates (including contact information), programs and funding opportunities. Use of this website by potential proposers is strongly encouraged. In addition, "NSF Update" is an information-delivery system designed to keep potential proposers and other interested parties apprised of new NSF funding opportunities and publications, important changes in proposal and award policies and procedures, and upcoming NSF Grants Conferences. Subscribers are informed through e-mail or the user's Web browser each time new publications are issued that match their identified interests. "NSF Update" also is available on NSF's website at https://public.govdelivery.com/accounts/USNSF/subscriber/new?topic_id=USNSF_179.

Grants.gov provides an additional electronic capability to search for Federal government-wide grant opportunities. NSF funding opportunities may be accessed via this mechanism. Further information on Grants.gov may be obtained at http://www.grants.gov.

ABOUT THE NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is an independent Federal agency created by the National Science Foundation Act of 1950, as amended (42 USC 1861-75). The Act states the purpose of the NSF is "to promote the progress of science; [and] to advance the national health, prosperity, and welfare by supporting research and education in all fields of science and engineering."

NSF funds research and education in most fields of science and engineering. It does this through grants and cooperative agreements to more than 2,000 colleges, universities, K-12 school systems, businesses, informal science organizations and other research organizations throughout the US. The Foundation accounts for about one-fourth of Federal support to academic institutions for basic research.

NSF receives approximately 55,000 proposals each year for research, education and training projects, of which approximately 11,000 are funded. In addition, the Foundation receives several thousand applications for graduate and postdoctoral fellowships. The agency operates no laboratories itself but does support National Research Centers, user facilities, certain oceanographic vessels and Arctic and Antarctic research stations. The Foundation also supports cooperative research between universities and industry, US participation in international scientific and engineering efforts, and educational activities at every academic level.

Facilitation Awards for Scientists and Engineers with Disabilities provide funding for special assistance or equipment to enable persons with disabilities to work on NSF-supported projects. See Grant Proposal Guide Chapter II, Section D.2 for instructions regarding preparation of these types of proposals.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs, employment or general information. TDD may be accessed at (703) 292-5090 and (800) 281-8749, FIRS at (800) 877-8339.

The National Science Foundation Information Center may be reached at (703) 292-5111.

The National Science Foundation promotes and advances scientific progress in the United States by competitively awarding grants and cooperative agreements for research and education in the sciences, mathematics, and engineering.

To get the latest information about program deadlines, to download copies of NSF publications, and to access abstracts of awards, visit the NSF Website at http://www.nsf.gov

- **Location:** 4201 Wilson Blvd. Arlington, VA 22230

- **For General Information** (NSF Information Center)**:** (703) 292-5111

- **TDD (for the hearing-impaired):** (703) 292-5090

- **To Order Publications or Forms:**

    Send an e-mail to: nsfpubs@nsf.gov

    or telephone: (703) 292-7827

- **To Locate NSF Employees:** (703) 292-5111

PRIVACY ACT AND PUBLIC BURDEN STATEMENTS

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch and to Congress. The information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers and researchers and educators as necessary to complete assigned work; to other government agencies or other entities needing information regarding applicants or nominees as part of a joint application review process, or in order to coordinate programs or policy; and to another Federal agency, court, or party in a

court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF-50, "Principal Investigator/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004), and NSF-51, "Reviewer/Proposal File and Associated Records," 69 Federal Register 26410 (May 12, 2004). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of receiving an award.

An agency may not conduct or sponsor, and a person is not required to respond to, an information collection unless it displays a valid Office of Management and Budget (OMB) control number. The OMB control number for this collection is 3145-0023. Public reporting burden for this collection of information is estimated to average 12 hours per response, including the time for reviewing instructions. Send comments regarding the burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to:

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Office of the General Counsel
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